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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/725,481	12/03/2003	John M. Drynan	M4065.0238/P238-C	3991
24998	7590	03/22/2005	EXAMINER	
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP			LEE, EUGENE	
2101 L Street, NW			ART UNIT	
Washington, DC 20037			PAPER NUMBER	
			2815	

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/725,481

Applicant(s)

DRYNAN, JOHN M.

Examiner

Eugene Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 47-78 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 64-68 is/are allowed.
- 6) ☒ Claim(s) 47-50, 54-59, 69-71 and 75-77 is/are rejected.
- 7) ☒ Claim(s) 51-53, 60-63, 72-74 and 78 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/3/03</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 47 is rejected under 35 U.S.C. 102(b) as being anticipated by Jost et al. 5,705,838. Jost discloses (see, for example, Fig. 5) a semiconductor memory device comprising a conductive layer (first conductive silicon-containing stud) 36, conductive layer (second conductive silicon-containing stud) 38, bit line (interconnect line) 55, and dielectric layer (insulating material) 28. In column 3, lines 66-67, Jost discloses the conductive layer 36 comprising polysilicon, and in column 4, lines 13-15, Jost discloses the conductive layer 38 comprising polysilicon.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 48 thru 50, and 54 thru 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jost et al. 5,705,838 as applied to claim 47, and further in view of Bryant 6,188,112 B1, and Matsumoto 6,069,060. Jost does not disclose said first

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conductive silicon-containing studs being epitaxial silicon. However, Bryant discloses (see, for example, FIG. 5) a semiconductor device comprising a contact comprising a plug 34, and epitaxial silicon region 36. The contact provides a connection to the region 20. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have said first conductive silicon-containing studs being epitaxial silicon in order to have a adequate contact to a region in a semiconductor device. Jost in view of Bryant does not disclose said second conductive silicon-containing studs being epitaxial silicon. However, Matsumoto discloses (see, for example, column 2, lines 5-44) an electrode made of single crystal silicon by epitaxial growth. In column 14, lines 40-57, Matsumoto discloses the electrode having a flattened surface and hence the concentration of electric field into the surface of the electrode can be prevented. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have said second conductive silicon-containing studs being epitaxial silicon in order to prevent the concentration of the electric field, thereby obtaining improved reliability.

Regarding claim 49, and 59, see, for example, FIG. 5, and column 2, line 54 wherein Bryant discloses a plug 34 made of silicide.

Regarding claim 54, see, for example, FIG. 5, wherein Jost discloses active regions (source, drain regions) 24, 26.

Regarding claim 55, see, for example, FIG. 5, wherein Jost discloses word lines (wordline gates) 24, 26 and word line (isolation gate) 16. The word line 16 is disposed on the field oxide 19.

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Regarding claim 56, and 58, the limitation “access transistor” is a functional limitation that does deter from the applicant’s claimed structural limitations. In addition, Jost discloses (see, column 1, lines 20-46) memory cells formed in DRAMs.

5. Claims 69 thru 71, and 75 thru 77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jost et al. 5,705,838 in view of Bryant 6,188,112 B1, and Matsumoto 6,069,060 as applied to claims 48-50, and 54-59 above, and further in view of Tsuchiaki 6,051,509 Jost in view of Bryant and Matsumoto does not disclose a processor. However, Tsuchiaki discloses (see, for example, FIG. 7(a)) an IC device comprising a DRAM A and processor B. The DRAM and processor form components of a microcomputer. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have a processor in order to form the DRAM in a more complex circuit such as a microcomputer.

#### *Allowable Subject Matter*

6. Claims 64 thru 68 are allowed. The following is a statement of reasons for the indication of allowable subject matter: The references of record, either singularly or in combination, do not teach or suggest at least at a memory device, comprising: at least one first epitaxial silicon stud with a silicide cap and at least one second epitaxial silicon stud without a silicide cap; and a conductive plug within said insulating sidewall and in electrical contact with said second epitaxial silicon stud.

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7. Claims 51 thru 53, 60 thru 63, 72 thru 74, and 78 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The references of record, either singularly or in combination, do not teach or suggest at least a memory device, comprising: a first conductive silicon-containing stud and a second silicon-containing stud; wherein said first and second conductive silicon-containing studs are epitaxial silicon, wherein said contact opening is over said interconnect line.

#### **INFORMATION ON HOW TO CONTACT THE USPTO**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Lee whose telephone number is 571-272-1733.

The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 571-272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Eugene Lee  
March 5, 2005

A handwritten signature in black ink, appearing to be 'Eugene Lee', written in a cursive style.